# MINERALOGICAL ABSTRACTS

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## Notices of Books.

ASK (Parker D.) (editor). *Recent marine sediments.* Tulsa, Oklahoma (The American Association of Petroleum Geologists) and London (Thomas Murby & Co.), 1939, 736 pp., 137 figs. Price \$5 = 22*s.* 6*d.*

This is a symposium of 34 papers by American and European workers on the conditions of formation of Recent marine deposits and on the regional petrography of these sediments. The volume was prepared under the direction of the committee on sedimentation of the National Research Council in Washington, the chairman of which has acted as editor and (with Marie Siegrist) has translated into English the contributions by German authors. Papers of mineralogical interest include articles on the properties of clay (R. E. Grim), on base-exchange in relation to sediments (W. P. Kelley), on glauconitization (Jun-ichi Takahashi; W. Wayne Galliher), and on the application of X-ray methods to the investigation of Recent sediments (Martin Mehmel). A contribution by K. Lüders on 'Sediments of the North Sea' makes no reference to the work of J. O. Borley and only includes one paper by a British author in a bibliography of 91 items! The indexes to the publication extend to seventy pages. C. F. D.

AARDEN (John). *Gold nuggets of the world.* Hollywood, California (Gaarden Publishing Company), 1940, xvi + 149 pp., 32 pls., 3 text-figs. Price \$1.

Information about gold nuggets (mainly from the Americas and Australia) and stories connected with their discovery have been diligently collected by the author, but the haphazard arrangement of the notes and the lack of an alphabetical index detract from the usefulness of the book. Previously, the 'Welcome Stranger' nugget (2284 oz. 16 dwt. 22 gr.) from Victoria was considered to be the largest known, but the author figures the model of a nugget from Carson Hill, California, found in 1854, which weighed 2340 oz. J. M. S.

## New Minerals.

ILLEY (C. E.). *Tricalcium disilicate (rankinite), a new mineral from Scawt Hill, Co. Antrim.* Min. Mag., 1942, vol. 26, pp. 190–196, 1 pl., 1 text-fig.

ANNISTER (F. A.), with chemical analyses by HEY (Max H.). *Kalsilite, a polymorph of $KAlSiO_4$, from Uganda.* Min. Mag., 1942, vol. 26, pp. 218–224, 1 pl., 1 text-fig.

AHEY (Joseph J.), with X-ray analysis by TUNELL (George). *Bradleyite, a new mineral, sodium phosphate-magnesium carbonate.* Amer. Min., 1941, vol. 26, pp. 646–650, 1 fig.

This was found together with shortite [M.A. 7–370] in oil shale in a one-inch layer of a drill core from a depth of 1343 feet near Green River, Sweetwater

Co., Wyoming. Layers above and below contained shortite and northupi It is very fine-grained (0·002 mm.) with strong birefringence (0·07), $\alpha$ 1·49, $\gamma$ 1· about; sp. gr. 2·734 (corrected for admixed clay). Analysis of the portion solul in dilute HCl (deducting clay 14·46, shortite 1 %, &c.) gave $Na_2O$ 31·42, M 12·91, $P_2O_5$ 22·03, $CO_2$ 15·38, corresponding with $Na_3PO_4.MgCO_3$. The mine is very slowly decomposed by cold water, only little $Na_2CO_3$ going into solutic X-ray powder photographs show the absence of magnesite. L. J. S.

Barsanov (G. P.). [*Ishkulite—a new mineral of the spinel group.* Compt. Ren (Doklady) Acad. Sci. URSS, 1941, vol. 31, pp. 468–471]; abstract in Am Min., 1942, vol. 27, p. 62.

A chromiferous magnetite occurs with diopside, actinolite, phlogopite, a calcite in contact rocks near lake Ishkul [where?]. It is tarry black, strong magnetic, and isotropic in reflected light; sp. gr. 5·079. Analysis gave $TiO_2$ 1·2 $Al_2O_3$ 0·03, $Cr_2O_3$ 11·19, $Fe_2O_3$ 61·04, FeO 24·05, NiO 0·18, MnO 0·54, MgO 1·3 $V_2O_5$ 0·32, $H_2O$ 0·02 = 99·92; deducting 2·24 % ilmenite and 16·47 % martit this gives the ratios $FeFe_2O_4 : FeCr_2O_4 : MgFe_2O_4 = 8·7 : 2·5 : 1$. L. J. S.

Gotman (J. D.). [*On the identity of tanatarite and diaspore.* Compt. Ren (Doklady) Acad. Sci. URSS, 1941, vol. 31, pp. 29–30]; abstract in Ame Min., 1942, vol. 27, p. 62.

Re-examination of type tanatarite (supposed to be monoclinic AlO(OH)) [M. 3–237, 473] shows that the optics agree with orthorhombic symmetry, and a X-ray powder photograph is identical with that of diaspore. L. J. S.

Dake (H. C.). *Brodrickite—a new mineral.* The Mineralogist, Portland, Oregon 1941, vol. 9, pp. 443–444.

Greenish-yellow, inelastic flakes with micaceous cleavage were found by Joh H. Brodrick in an old limestone quarry at Bolton, Massachusetts. Optic axia angle approximately 12–15°, $\beta$ and $\gamma > 1·560$ $< 1·565$. Spectroscopic analysi shows that it is essentially Mg-Al silicate, with $Fe_2O_3$ 1·5, $K_2O$ 1·0–2·0, $Na_2$ nil, $Rb_2O$ 0·1–0·2, $Li_2O$ 0·1 %, Ca trace. The X-ray pattern differs from thos of the chlorites, vermiculite, and phlogopite, but shows some similarity to th last of these. The mineral is evidently a hydrothermal alteration product o phlogopite. Optical data by E. E. Fairbanks, spectroscopic by Morris Slavin and X-ray by Howard F. Carl, all of the U.S. Bureau of Mines; but no indicatio is given whether this has been previously published. L. J. S.

Sharma (N. L.). *Royite, a new variety of quartz, from the Jhaira coal-field.* Proc Indian Acad. Sci., Sect. B, 1940, vol. 12, pp. 215–220, 2 pls.

Blades of flattened prisms ($\frac{1}{2}$–$1\frac{1}{2} \times \frac{1}{8}$–$\frac{1}{4}$ and $\frac{1}{30}$ inch thick) form radial an reticulate groups on the joint-planes of sandstones and shales, together wit pyramidal crystals of ordinary quartz and white encrustations of colloidal an cryptocrystalline silica. They are brownish-black to black, greyish in thi fragments, and have good prismatic and rhombohedral cleavages, breaking int rhomboidal fragments with metallic schiller. The hardness, specific gravity, an

ctive indices are those of quartz. Analysis by S. C. Niyogy of material sing some biotite and limonite gave $SiO_2$ 95·78, $TiO_2$ trace, $Al_2O_3$ 1·80, $_3$ 0·14, MnO 0·03, MgO 2·04, CaO 0·37 = 100·16. L. J. S.

## Topographical Mineralogy.

RANDER (Charles W.) & PRICE (Walter E. *Jr.*). *Minerals of Maryland.* Baltimore, Maryland (Nat. Hist. Soc. Maryland), 1940, 92 pp., 1 plate, 19 text-figs. Price 60 cents.

he chief mineral-bearing region of Maryland is the piedmont plateau which nds from the coastal plain to the foot of the Appalachians. It consists of es of quartzite and similar rocks with valleys of limestone. A short résumé ne development of the mines and quarries of the state is followed by a topo- hical section, arranged under counties, where the localities with lists of erals are clearly set out. The most important district seems to be Baltimore nty (with Baltimore City) from which baltimorite, gymnite, haydenite, and montite were first described. Notes on meteorites and fluorescent and nescent minerals from Maryland, together with a bibliography of its eralogy, an alphabetical list of minerals with localities, and a locality index plete this useful little book. J. M. S.

YERS (T. R.). *New Hampshire minerals and mines.* Concord, New Hampshire (The State Planning and Development Commission), 1941, 49 pp., 1 map.

his book is written in the form of an alphabetical list of minerals found in w Hampshire. There is a short description of the mode of occurrence of each eral, with list of localities usually not given in detail, bibliographical references, notes on industrial uses. In most cases the deposits do not seem to be of mmercial importance. An index of the principal localities with their minerals llowed by a note on the history of the mines and a bibliography which udes 73 New Hampshire references. There is a useful map (scale, 8 miles = ch) showing the mines and prospects. J. M. S.

LBRAITH (F. W.). *Minerals of Arizona.* Bull. Arizona Bureau of Mines, 1941, no. 149 (Geol. Ser. no. 15) = Bull. Univ. Arizona, vol. 12, no. 3, 82 pp. Price 50 cents.

his gives brief accounts of the occurrences of 268 mineral species in Arizona. e essential characters of each species are enumerated, and the several localities listed under counties. It shows a considerable increase on the 120 species ed by F. N. Guild in 1910 [Min. Mag. **16**–73]. L. J. S.

NELLA (Vincent P.). *Nevada's common minerals.* Bull. Univ. Nevada, Geol. and Mining Ser., 1941, no. 36. 110 pp. Price 50 cents.

his bulletin is intended for prospectors and collectors. It is divided into: t 1, origin, occurrence, and association of minerals; part 2, their general racters; part 3, description of 125 common minerals with determinative les; part 4, preliminary list of 400 species that have been found in Nevada. L. J. S.

Verrow (Harold J.). *Pegmatite minerals of the Palermo quarry, North Grot N.H.* Rocks and Minerals, Peekskill, N.Y., 1941, vol. 16, pp. 208–211.

A note on the mineral-paragenesis is followed by a descriptive list of minerals. The pegmatite contains a number of interesting phosphates, includi graftonite [M.A. **3**–360], fairfieldite, ferri-sicklerite [M.A. **6**–485], and the n mineral whitlockite [M.A. **8**–99] which was discovered by the author in 1939. J. M. S.

Verrow (Harold J.). *The pegmatite minerals of Black Mountain, Rumford, Mai* The Mineralogist, Portland, Oregon, 1941, vol. 9, pp. 119–120, 143.

A description of the lithia-bearing pegmatite. Three stages of mineralizati have been recognized and minerals from each are listed. These include eosphor and also uraninite and triphylite and their alteration products. J. M. S.

Palache (Charles). *Contributions to the mineralogy of Sterling Hill, New Jers morphology of graphite, arsenopyrite, pyrite, and arsenic.* Amer. Min., 194 vol. 26, pp. 709–717, 11 figs.

Small crystals of graphite from Sterling Hill, New Jersey, and Ticonderog New York, have been measured and show full hexagonal symmetry, axial rat $a : c = 1 : 2{\cdot}7522$. Dominant forms are $c(0001)$, $p(10\bar{1}1)$, and $o(10\bar{1}2)$. Twinni occurs on the face of a second order pyramid, probably $(11\bar{2}1)$. Minerals associat with graphite in coarsely crystalline limestone from Sterling Hill are mispick pyrite, arsenic, diopside, realgar, and an undetermined antimony mineral. F. A. B.

Sleight (V. G.). *Molybdenite at Magnet Cove, Arkansas.* Amer. Min., 1941, v 26, pp. 132–133.

Molybdenite occurs disseminated in grey, siliceous material and also as a th coating on pyrite crystals. A list of all minerals (59 species) observed at th locality is given. F. A. B.

Keller (W. D.). *Aurichalcite in Missouri.* Amer. Min., 1940, vol. 25, pp. 37 376.

Small radial aggregates of bladed crystals of aurichalcite occur on hem morphite, with blende, covelline, and malachite in a breccia of chert and dolomit limestone in the Shinn mine, Stark City, Newton Co. (near the Joplin area). L. J. S.

Bagrowski (Benedict P.). *Occurrence of millerite at Milwaukee, Wisconsi* Amer. Min., 1940, vol. 25, pp. 556–559.

Fine hair-like crystals of millerite occur with blende, pyrite, and marcasite i calcite-lined cavities in dolomitic limestone of Devonian age. In collections th locality of these specimens is stated variously: they came from an old quarr in what is now Estabrook Park, Milwaukee. L. J. S.

H (Peter A.). *Minerals of the Butte district, Montana.* Rocks and Minerals, Peekskill, N.Y., 1941, vol. 16, pp. 241–248, 2 figs.

e mines of the Butte district, Montana, produce copper, silver, lead, zinc, manganese, and many fine specimens have been collected there. A descriptive f 85 species and varieties of minerals has been compiled from all available ces. The more interesting items include stephanite, enargite, colusite [M.A. 8, 7–466], and the beautiful, pyrite-coated, hexagonal plates of covelline. t of the mines in which each mineral was found would have been a useful tion as the present information is at times rather vague. J. M. S.

DOCH (Joseph) & WEBB (Robert W.). *Notes on some minerals from southern California. II.* Amer. Min., 1940, vol. 25, pp. 549–555, 1 fig. [M.A. 7–549.] ystallographic measurements are given of inyoite. Other minerals described nodules of celestine, baryte, and calcite; calcite-sand crystals enclosing of sand; veatchite; rhodonite; axinite; garnet and epidote; fayalite tals in lithophysae in rhyolite. L. J. S.

SEN (M.). *Preliminary report on minerals of geysers of Sonoma County, California.* The Mineralogist, Portland, Oregon, 1941, vol. 9, pp. 245–248.

preliminary description of the minerals from 'The Geysers'. This district maroles, hot springs, &c., has been mapped by the author and many samples s minerals taken. Most of these are sulphates which are readily dissolved ng the rainy period and include mascagnite, boussingaultite, tschermigite, aite, and some unidentified specimens, thought to be new species.

J. M. S.

(Horatio C.). *Minerals of Porto Rico.* Rocks and Minerals, Peekskill, N.Y., 1941, vol. 16, pp. 355–359, 1 pl. (map).

brief survey is given from the commercial point of view of the mineral osits of Porto Rico under the headings: metallic minerals, non-metallic erals, and rock-forming minerals. There is a useful map (scale, 1 km. = 0·218 ) showing the natural resources of the island. J. M. S.

## Rock-forming Minerals and Petrology.

NESS (Arthur P.) & JEFFRIES (Charles D.). *Authigenic albite from the Lowville limestone at Bellefonte, Pennsylvania.* Journ. Sedim. Petrology, 1940, vol. 10, pp. 12–18, 2 figs.

p to 90 % of the insoluble residue from a fine-grained bedded limestone con- s of crystals of authigenic albite, of average composition $Ab_{98\cdot3}An_{1\cdot7}$, and of ximum grain-size 0·25 mm. Optical data and six chemical analyses are given, the analysed specimens being potash free. The mode of occurrence suggests mation in the calcareous muds of the sea floor during deposition and com- tion of the sediments. C. F. D.

SS (H. H.). *Pyroxenes of common mafic magmas.* Amer. Min., 1941, vol. 26, pp. 515–535, 573–594, 14 figs.

he pyroxenes of the common basic rocks are discussed and classified within

a $CaSiO_3$–$MgSiO_3$–$FeSiO_3$ system into varieties referred to as diopside, salit ferrosalite, hedenbergite, endiopside, augite, ferroaugite, and pigeonite. T lime-poor clinopyroxene pigeonite ($2V < 32°$) is considered to be a miner variety distinct from augite ($2V > 39°$). Intermediate values for the optic ang of clinopyroxenes are unknown. Augite and pigeonite show limited solid solutio and commonly these pyroxenes crystallize in equilibrium with one anothe With slow cooling, pigeonite inverts to hypersthene containing oriented plat of clinopyroxene, the inversion temperature increasing with the ratio Mg : F while in magmas which solidified below the inversion temperature orthopyroxe crystallizes in place of pigeonite. It is thus possible to use the pyroxenes prese in a basic rock as a geological thermometer. Published chemical analyses pigeonite, except that of Hallimond (Min. Mag., 1914), are said to be of mixtur of pigeonite and augite or of material partly inverted to hypersthene. Ne analyses by R. B. Ellestad of hypersthene inverted from pigeonite, I (2·5 augite deducted) from the Bushveld complex, II from the Stillwater (Montan diabase, are:

| | $SiO_2$. | $TiO_2$. | $Al_2O_3$. | $Fe_2O_3$. | FeO. | MnO. | MgO. | CaO. | $Na_2O$. | $K_2O$. | Tota |
|---|---|---|---|---|---|---|---|---|---|---|---|
| I. | 51·40 | 0·30 | 1·78 | 1·40 | 20·68 | 0·48 | 19·37 | 4·07 | 0·11 | — | 100·0 |
| II. | 50·24 | 0·69 | 4·52 | 0·41 | 21·81 | 0·43 | 15·81 | 4·39 | 0·18 | 0·04 | 99·9 |

I, also $H_2O+$ 0·37, $H_2O-$ 0·04; II, $H_2O+$ 1·42, $H_2O-$ 0·04.

C. F. D.

Benson (W. N.) & Turner (F. J.). *Comparative composition-variation diagran for the Cainozoic igneous rocks of New Zealand with determinations of the opt axial angles of the pyroxenes and olivines contained therein.* Trans. Roy. So New Zealand, 1939, vol. 69, pp. 56–72, 5 pls., 1 text-fig.

Composition plots are given for nearly 200 chemical analyses of basalts an some more alkalic types grouped in districts, North Island, Banks' Peninsul and Dunedin. The normative composition of the pyroxenes is calculated an plotted on a triangular diagram En–Fs–Wo together with the optic axial angle 2V mostly 44–58°, a few 38–60°, in Dunedin basalts. In the Dunedin basal the phenocrysts are diopsidic titanaugite, and in the groundmass diopsid titanaugite with orthorhombic pyroxene, while in other districts diopsidic augi is almost the only pyroxene present. Olivine in the basalts ranges 72–79 % F in olivine-phonolite 85–90 %, and in some other rocks as low as 24 %

[M.A. 5–219, 6–295.] L. J. S.

Putte (R. Vande). *Contribution à l'étude des amphiboles.* Bull. Musée Hist Nat. Belgique, 1939, vol. 15, no. 31, 21 pp., 6 figs.

New data on the chemical composition and optical constants of eightee amphiboles are presented, and the molecular constitution is calculated accordin to Warren's formula. The analysed specimens, from Belgian museum collection include tremolite-actinolites, hornblendes, and pargasites, but the informatio given regarding parent rock and locality is scanty. Graphs are reproduced t show the variation of refractive index with chemical composition.

C. F. D.

RIETZ (Torsten). *The injection metamorphism of the Muruhatten region and problems suggested thereby.* Årsbok Sveriges Geol. Undersökning, 1938, vol. 32, no. 6, 86 pp., 29 figs. Price 2.00 kr.

his memoir is a petrographical and mineralogical study of the injection of -schists, amphibolites, and peridotites [M.A.6–216] by magmas of trondhjem-adamellite, and potash-granite. Many new chemical analyses of host and tion rocks are given, and an investigation is made of the optical properties large number of green hornblendes from normal and migmatitized amphi-es. Green hornblendes, I from metasomatically recrystallized amphibolite, jällsgruvan, II from amphibolite-migmatite, Muruhatten, give on analysis lyst, N. Sahlbom):

| | $SiO_2$. | $TiO_2$. | $Al_2O_3$. | $Fe_2O_3$. | FeO. | MnO. | MgO. | CaO. | $Na_2O$. |
|---|---|---|---|---|---|---|---|---|---|
| ... | 48·64 | 0·29 | 8·94 | 1·54 | 8·78 | 1·16 | 16·42 | 12·64 | 0·49 |
| ... | 42·41 | 0·65 | 12·15 | 4·47 | 12·49 | 0·19 | 14·79 | 11·15 | 0·96 |

| | $K_2O$. | $H_2O+$. | F. | Total. | $\alpha$. | $\gamma$. | $2V_\alpha$. | $c:\gamma$. | Sp. gr. |
|---|---|---|---|---|---|---|---|---|---|
| ... | 0·27 | 0·69 | 0·00 | 99·86 | 1·636 | 1·661 | 88½° | 16° | 3·12 |
| ... | 0·24 | 0·26 | 0·00 | 99·76 | 1·6515 | 1·673 | 92 | 14 | 3·19 |

C. F. D.

NSON (W. N.). *Kaersutite and other brown amphiboles in the Cainozoic igneous rocks of the Dunedin district.* Trans. Roy. Soc. New Zealand, 1939, vol. 69, pp. 283–308, 5 figs.

Kaersutite (titanium-rich basaltic hornblende), I from kaiwekite (a porphyritic vine-bearing anorthoclase 'trachyte'), Purakanui, Dunedin, and II from chybasalt, Leith Valley quarry, Dunedin, has the following chemical com-sition. Analyses by F. T. Seelye.

| | $SiO_2$. | $TiO_2$. | $Al_2O_3$. | $Fe_2O_3$. | FeO. | NiO. | MnO. | MgO. | BaO. | CaO. |
|---|---|---|---|---|---|---|---|---|---|---|
| ... | 38·79 | 6·66 | 13·98 | 3·15 | 8·44 | 0·03 | 0·18 | 11·88 | 0·03 | 12·20 |
| ... | 39·01 | 6·05 | 13·60 | 5·25 | 7·42 | 0·03 | 0·14 | 11·73 | 0·03 | 12·05 |

| | $Na_2O$. | $K_2O$. | $H_2O+$. | $H_2O-$. | $P_2O_5$. | F. | S. | Total. | Sp. gr. |
|---|---|---|---|---|---|---|---|---|---|
| ... | 2·42 | 0·92 | 0·93 | 0·40 | 0·03 | abs. | 0·02 | 100·06 | — |
| ... | 2·51 | 1·11 | 0·98 | 0·19 | 0·03 | abs. | trace | 100·13 | 3·272 |

he optical properties of II are $\alpha$ 1·6821, $\beta$ 1·6975, $\gamma$ 1·717, 2V 78°, negative, $\alpha$ pale yellow, reddish-brown, $\gamma$ dark reddish-brown.

C. F. D.

ENTOR (Y.). *Sur une trachyandésite à kaersutite et cristobalite parmi les laves de la Chaîne des Puys.* Compt. Rend. Acad. Sci. Paris, 1941, vol. 213, pp. 211–214.

The rock of the Puy de Clierzou contains phenocrysts (1 cm.) of zoned andesine nd elongated prisms of kaersutite in a groundmass of oligoclase, soda-orthoclase, nd 35–75 % glass. Cristobalite as grains is rare in the glassy varieties but in he more crystalline it forms 10 % of the rock. L. J. S.

Bentor (Y.). *Sur quelques minéraux des laves de la Chaîne des Puys.* Comp Rend. Acad. Sci. Paris, 1941, vol. 213, pp. 289–292.

In the acidic rocks quartz is rare, tridymite more frequent, and cristobali common, forming 10 % of the bulk of some trachytes. Pseudomorphs of crist balite after tridymite also occur. Kaersutite as prisms up to 5 cm. long is prese in enclaves in trachyandesite from Puy de Clierzou; 2V 76–88°, negativ pleochroism strong, $\alpha$ yellowish-green, $\beta$ reddish-brown, $\gamma$ dark reddish-brow partial analysis gave $TiO_2$ 8·77, MnO 0·13, $Na_2O$ 2·12, $K_2O$ 0·98. Small crysta of pseudobrookite and orthite are also described. L. J. S.

Jakob (J.). *Zwei Glaukophangesteine aus dem Val de Bagnes.* Schweiz. Min. Pet Mitt., 1941, vol. 21, pp. 136–138.

A grey-blue compact rock consisting almost entirely of glaucophane with littl sericite gave: $SiO_2$ 52·64, $TiO_2$ 2·11, $Al_2O_3$ 13·87, $Fe_2O_3$ 4·48, FeO 6·83, Mn 0·08, MgO 8·28, CaO 1·98, $Na_2O$ 6·08, $K_2O$ 0·99, $P_2O_5$ 0·24, $H_2O+$ 2·53, $H_2O-$ 0·0 = 100·11. Analysis is also given of a glaucophane-epidote-albite-schist from th same locality in Wallis. L. J. S.

Shafranovsky (I. I.) Шафрановский (И.И.). Материалы к изучению роговы обманок из пегматитовых выделений Хибинских тундр.—*On the study o hornb[l]endes from the pegmatite formations of the Khibina tundras.* Трудь Ломоносов. Инст. Акад. Наук СССР, Мин. Сер. (Trans. Lomonossov Inst Acad. Sci. U.S.S.R., Ser. Min.), 1937, no. 10, pp. 49–59, 1 fig. (Russian with English summary.)

Crystallographic and optical data are provided for eight crystals of hornblende from the pegmatites of Khibina tundra, together with three analyses by M. E. Vladimirova: I from Lovchorr, II from col Loparsky, III from Petrelius gorge:

| | $SiO_2$. | $TiO_2$. | $ZrO_2$. | $Al_2O_3$. | $Fe_2O_3$. | Rare-earths. | FeO. | MnO. | MgO. | CaO. | SrO. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| I. | 45·92 | 2·58 | present | 4·24 | 9·53 | — | 15·50 | 2·31 | 6·02 | 4·18 | trace |
| II. | 47·04 | 2·48 | present | 4·18 | 8·63 | nil | 16·30 | 2·59 | 6·40 | 4·07 | trace |
| III. | 48·35 | trace | nil | 5·19 | 4·74 | nil | 15·90 | 2·06 | 8·60 | 4·66 | nil |

| | | $Na_2O$. | $K_2O$. | Total. | $\alpha$. | $\beta$. | $\gamma$. | 2V (approx.) | $\gamma : c$. |
|---|---|---|---|---|---|---|---|---|---|
| I. | ... | 7·59 | 1·92 | 99·79 | 1·653 | 1·666 | 1·674 | 80° | 34° |
| II. | ... | 7·03 | 1·47 | 100·19 | 1·680 | 1·692 | 1·703 | 80 | 40 |
| III. | ... | 9·30 | 1·49 | 100·29 | 1·659 | 1·673 | 1·677 | 90 | 42 |

All are optically negative, dispersion $r < v$, optic axial plane (010), pleochroism strong. Chemically the hornblendes are near to arfvedsonite and barkevikite. S. I. T.

Ivanov (B. V.) Иванов (Б. В.). Материалы к исследованию слюд Хибинских тундр.—*On the investigation of micas of the Khibina tundras.* Труды Ломоносов. Инст. Акад. Наук СССР, Мин. Сер. (Trans. Lomonossov Inst. Acad. Sci. U.S.S.R., Ser. Min.), 1937, no. 10, pp. 37–47. (Russian with English summary.)

Analyses (by V. A. Egorova) and optical properties of two fresh lepidomelanes

pegmatite and mica-nepheline-syenite from Khibina tundra, Kola peninsula, iven: I from Kukisvumchorr ($\alpha$ 1·623, $\gamma$ 1·675, 2E 20–23°), II from Risiok y ($\alpha$ 1·623, $\gamma$ 1·675, 2E 30–33°):

| | $SiO_2$. | $TiO_2$. | $Al_2O_3$. | $Fe_2O_3$. | FeO. | MnO. | MgO. | CaO. | BaO. | $Na_2O$. |
|---|---|---|---|---|---|---|---|---|---|---|
| ... | 36·53 | 6·09 | 8·99 | 4·41 | 19·91 | 0·75 | 9·03 | nil | 0·58 | 0·83 |
| ... | 35·35 | 3·70 | 7·96 | 9·89 | 19·91 | 1·11 | 7·02 | nil | 0·09 | 0·50 |

| | $K_2O$. | F. | Cl. | $CO_2$. | $H_2O+$. | $H_2O-$. | Total. | Total less O for F. |
|---|---|---|---|---|---|---|---|---|
| ... | 8·98 | 1·25 | 0·01 | 0·27 | 2·20 | 0·83 | 100·66 | 100·11 |
| ... | 9·00 | 0·90 | — | — | 3·66 | 1·39 | 100·48 | 100·10 |

comparison of these analyses with previously published analyses of altered omelanes from the same locality shows in the altered minerals an increase O, CaO, $Al_2O_3$, and MnO, and a decrease of MgO and $K_2O$. S. I. T.

BAIRN (H. W.). *Petrofabric relations of nepheline and albite in litchfieldite from Blue Mountain, Ontario.* Amer. Min., 1941, vol. 26, pp. 316–320, 3 figs.

bular albite is oriented with (010) parallel to the foliation probably as a t of magmatic flow, whereas the nepheline later deposited from stagnant r is oriented with *c*-axis along the lineation of the albite crystals.

F. A. B.

WELL (P. G. H.). *Stability of minerals in sedimentary rocks.* Nature, London, 1941, vol. 147, pp. 734–737.

his article, abridged from Part 2 of the presidential address to the Geological ety of London (Quart. Journ. Geol. Soc., 1942, vol. 97 (for 1941), pp. lvi–), is a general review of problems relating to the persistence of mineral ns in sediments. Apatite is given as an example of a vulnerable species.

C. F. D.

THSON (Frank). *The alteration of detrital minerals in the Mesozoic rocks of Yorkshire.* Geol. Mag. Hertford, 1941, vol. 78, pp. 97–112, 7 figs.

he Upper Jurassic and Triassic rocks of Yorkshire yield rich assemblages of y minerals in the more southerly outcrops, but over the Cleveland axis the ber of detrital species is smaller because of decomposition subsequent to sition. The distribution of garnet, monazite, staurolite, and authigenic ase and brookite is discussed, with sketch-maps. A 'tentative list of detrital erals arranged in order of relative stability' is: very unstable—ferromagnesian erals; unstable—kyanite, staurolite, garnet; somewhat unstable—monazite; le—apatite, tourmaline, rutile, zircon. Intrastratal conditions which etch et leave apatite uncorroded: much of the corrosion found in apatite is due cent weathering. C. F. D.

TIJOHN (F. J.). *Persistence of heavy minerals and geologic age.* Journ. Geol. Chicago, 1941, vol. 49, pp. 610–625, 4 figs.

statistical study of heavy mineral suites of arenaceous sediments, based on ished European (mainly British) and American records, confirms that the plexity of these suites decreases with increasing geological age, due to

intrastratal solution of the less stable species. The order of persistence of common minerals is drawn up, ranging from rutile and zircon (most persistent) actinolite and olivine (most unstable). Contrary to Milner's opinion [M.A. 8- apatite has a high persistence value. C. F. D.

Grout (Frank F.). *Formation of igneous-looking rocks by metasomatism: a critic review and suggested research.* Bull. Geol. Soc. Amer., 1941, vol. 52, pp. 152 1576, 1 pl., 4 text-figs.

The flood of modern petrological literature advocating the origin of certa granites by metasomatic replacement of older rocks is discussed, with critic comment on many well-known papers. Of the numerous rock masses said originate by such processes, 'it is hard to find a really conclusive large examp that has been described in detail'. Until a thorough study is made of a promisi district, with result favourable to the hypothesis, caution should be exercis by petrologists who suggest a metasomatic origin for igneous-looking roc The requirements of a good report to establish such a type area are describ in detail. C. F. D.

Braun (Franz J.). *Die Granitvorkommnisse um Tellnitz im Erzgebirge, der Beziehung zu den Zinnerzlagerstätten von Graupen, Zinnwald und Altenbe i. Erzgeb.* Min. Petr. Mitt. (Tschermak), 1941, vol. 53, pp. 93–117, 1 fi (map).

The granite mass of Tellnitz [= Chlumec, 9 km. NW. of Aussig = Ús Bohemia] differs from the tin-bearing granites of Graupen [= Krupka], Zinnwa [= Cínvald], and Altenberg (Saxony) in grain-size and the proportion of i constituents (no chemical analysis given); it shows no greisenization and topa ization, and contains no tin-ore. It is correlated with the later and little-alter 'Gebirgs' granite of the Kaiserwald. L. J. S.

Demay (André). *Sur les relations des granites, aplites, microgranites et rhyoli de l'extrémité est du massif de Guéret et sur le problème de leur genèse.* Comp Rend. Acad. Sci. Paris, 1941, vol. 213, pp. 455–457.

Calco-alkalic granite passes towards the border into alkalic granite and t grades through microgranite and aplite to rhyolite. L. J. S.

Jérémine (*M^me* E.). *Sur quelques granites des Vosges.* Compt. Rend. Acad. S Paris, 1940, vol. 210, pp. 571–573.

Thirteen analyses (12 of them new) of biotite-granites with hornblende a of two-mica granites show $SiO_2$ 68·16–75·80, $Na_2O$ 2·90–3·83, $K_2O$ 4·36–6·25 &c. Analysis is also given of a granodiorite ($SiO_2$ 63·66 %). L. J. S.

Simonen (Ahti). *Chemical study of the orbicular rock in Kemijärvi.* Bull. Com Géol. Finlande, 1938, no. 123, pp. 47–49.

This orbicular rock, surrounded by migmatitic granites, consists of spheroi about 14 cm. diameter with a plagioclase-rich core (I) and a microcline-ri outer zone (II), in a matrix of granodiorite (III) with migmatitic patches of lig

granite (IV). The last analysis is similar to the bulk composition of the roids. [M.A. **4**–40, **5**–226, **6**–304, **7**–305.]

| | $SiO_2$. | $TiO_2$. | $Al_2O_3$. | $Fe_2O_3$. | FeO. | MnO. | MgO. | CaO. | $Na_2O$. | $K_2O$. | $H_2O$. | Total. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I. | 65·51 | 0·17 | 20·01 | 0·67 | 0·52 | — | 0·02 | 3·24 | 7·66 | 0·96 | 1·02 | 99·78 |
| II. | 73·91 | <0·01 | 13·55 | 0·31 | — | — | <0·01 | 0·07 | 1·89 | 9·38 | 0·80 | 99·91 |
| III. | 56·83 | 0·97 | 16·62 | 3·20 | 5·11 | 0·91 | 3·29 | 5·36 | 4·63 | 1·41 | 1·24 | 99·57 |
| IV. | 71·36 | 0·19 | 14·02 | 0·56 | 1·82 | — | 0·59 | 1·39 | 3·82 | 5·21 | 1·21 | 100·17 |

C. F. D.

DSPEED (G. E.). *Orbicular rock from Buffalo Hump, Idaho.* Amer. Min., 1942, vol. 27, pp. 37–47, 11 figs.

nes of orbicular rock occur in remnants of quartz-biotite-schist enclosed in diorite. The orbicules are from less than an inch to several inches across, they show various stages of development from groups of felspar porphyro- s. They consist of radial aggregates of andesine ($An_{36-37}$), and sometimes cores of recrystallized schist and veinlets of quartz and felspar. The thization is evidently due to the metasomatic action of solutions.

L. J. S.

VEY (Madeleine) & JOPLIN (Germaine A.). *A note on some leucite-bearing rocks from N.S.W., with special reference to an ultrabasic occurrence at Murrumburrah.* Journ. Roy. Soc. New South Wales, 1941, vol. 74 (for 1940), pp. 419–442, 4 figs.

he 'leucite-basalt' of Murrumburrah is described as monchiquite. It occurs like-like masses cutting granite, and contains olivine, pyroxene, magnetite, leucite, with or without nepheline and biotite, but no felspar. Leucite forms ll crystals or interstitial grains in the groundmass. A pegmatitoid phase is esented by small cavities containing larger crystals of these minerals; and ydrothermal or deuteric phase shows cavities filled with zeolites, calcite, gonite, and chlorite. Four analyses show $SiO_2$ 39·51–41·72, $TiO_2$ 2·19–2·74, $O_3$ 10·83–15·05, $Fe_2O_3$ 2·43–5·30, MgO 11·56–12·53, CaO 9·64–10·96, $Na_2O$ 4–4·50, $K_2O$ 1·28–1·67, &c. This composition is compared with that of burgite. There are ultrabasic inclusions of dunite, harzburgite, and pyroxene. noliths of granite are hybridized, biotite being replaced by magnetite, and rtz is rimmed with pyroxene. Other scattered occurrences of 'leucite-basalt', luding the earliest recorded from Byrock [Min. Mag. **7**–194], are briefly cribed as mica-leucite-basalt or lamproite.

L. J. S.

CROIX (Alfred). *Essai d'interprétation de la genèse des gisements malgaches de phlogopite.* Compt. Rend. Acad. Sci. Paris, 1941, vol. 212, pp. 941–945.

The pockets and veins of phlogopite with associated calcite, apatite, anhydrite, orite, pyroxene, &c., occur in the middle of banks of pyroxenite in granitized rystalline schists in the south of Madagascar. It is suggested that they were med by pneumatolytic action at a high temperature with various mineralizers , $P_2O_5$, $CO_2$, $SO_3$, $WO_3$, $MoO_3$, $H_2O$) from granite. The associated veins of gmatitic dissogenite are the result of later phases of the same action. [M.A. 469; **8**–34, 35.]

L. J. S.

Lacroix (Alfred). *Péridotite et sagvandite du sud de Madagascar.* Compt. Rend. Acad. Sci. Paris, 1941, vol. 213, pp. 261–265.

A bank some decimetres thick of peridotite is in contact with the pyroxenite which carries the phlogopite vein mined at Ampandandrava. The olive-green rock consists of grains and flattened crystals of olivine with an irregular distribution of large plates of biotite. Calcite nests contain crystals of olivine up to 20 cm. across and rich in faces. The rock is traversed by veins of pegmatite, dissogenite (showing large cleavages of microcline with bluish reflections) and by veinlets of anorthite. Three chemical analyses are given of the rock, which may be an intrusive dike or of metamorphic origin. Sagvandite from mica deposits of the same type at Benato is a coarse-grained, grey or yellow rock composed of bronzite and ferriferous magnesite. Analysis gave $SiO_2$ 30·3, FeO 5·53, MgO 39·73, $CO_2$ 23·03, &c. It is richer in magnesite than the original sagvandite from lake Sagvand, Tromsö, Norway, of which a new analysis is given. [M.A. **3**–291, **4**–286]. L. J. S.

Drever (H. I.). *The geology of Ardgour, Argyllshire.* Trans. Roy. Soc. Edinburgh, 1940, vol. 60, pp. 141–170, 1 pl., 10 text-figs.

—— *A petrological study of the limestones in the Moine Series of Ardgour, Argyllshire.* Geol. Mag. London, 1939, vol. 76, pp. 501–518, 2 figs.

The Moine Series (felspathic granulites, quartzites, limestones, calc-silicate rocks, and pelitic gneisses) is intruded by two large sheet-like masses of a gabbro-dioritic rock of appinitic affinities, locally grading towards the margins into basic appinite and ultrabasic rocks. The paragneisses include a diversity of rocks subjected to regional metamorphism on two occasions separated by a period when they were thermally metamorphosed by the igneous masses and to some extent injected or permeated by acid magma. A dolomitic forsterite-limestone associated with dunitic serpentine is believed to have arisen from the low-temperature carbonation of the latter. [M.A. **7**–74.] C. F. D.

Reynolds (Doris L.). *A gabbro-granodiorite contact in the Slieve Gullion area and its bearing on Tertiary petrogenesis.* Quart. Journ. Geol. Soc. London, 1941, vol. 97, pp. 1–38, 2 pls., 6 text-figs.

Towards a contact with Tertiary gabbro in Co. Armagh, a Caledonian granodiorite shows a progressive increase in parallel-sided lanes of felsitic material rimming the quartz crystals, with a concomitant decrease in felspar and quartz. Analytical evidence is presented on the diffusion that has taken place across the contact, and the bearing of similar metasomatism on the petrogenesis of Tertiary craignurites, adamellites, and granophyres is discussed. C. F. D.

Reynolds (Doris L.). *Contact metamorphism by a Tertiary dyke at Waterfoot, Co. Antrim.* Geol. Mag. Hertford, 1940, vol. 77, pp. 461–469, 3 figs.

Felsitic material, often of spherulitic habit and resembling felsite of igneous origin, has developed as a result of potash metasomatism in Triassic pebble beds at their junction with a Tertiary olivine-dolerite dike. The spherulites are formed of quartz paramorphing tridymite. C. F. D.

LAR (Archibald Thomas John). *The Lundy complex: its petrology and tectonics.* Quart. Journ. Geol. Soc. London, 1941, vol. 97, pp. 39–77, 5 pls., 7 text-figs., geol. map.

he granite of Lundy Island in the Bristol Channel is a multiple intrusion, isting of two alkalic granite masses penetrated by minor dikes and sills of ogranite. These rocks are correlated with the Permo-Carboniferous granites ornwall. A swarm of some 150 dikes, including crinanites, olivine-dolerites, tz-dolerites, tholeiites, tachylytes, orthophyres, potash-trachytes, and pitch-es, is, however, referred to a Tertiary age. C. F. D.

AN (Olof H.). *Urbergsgeologiska undersökningar inom Norrbottens län.—On the pre-Cambrian geology of Swedish Lapland.* Årsbok Sveriges Geol. Undersökning, 1939, vol. 33, no. 6, pp. 1–94 (Swedish), 94–100 (English summary), 1 map, 16 pls., 4 text-figs. Price 3.00 kr.

ate pre-Cambrian sediments and greenstones, widely distributed in northern lish Lapland, are intruded by gabbro, harzburgite, syenite, granite, and natitic gneisses. The greenstones include metamorphosed lavas, sills, and , the most interesting being widespread albite-rich leuco-diabases of spilitic ities, poor in ferromagnesian minerals (hornblende), and sometimes bearing ary ankeritic carbonates. C. F. D.

LMQVIST (Sven). *Some post-Silurian dykes in Scania and problems suggested by them.* Årsbok Sveriges Geol. Undersökning, 1939, vol. 33, no. 10, 24 pp., 8 pls., 3 text-figs.

he dikes described, probably of Permo-Carboniferous age, include augite-rich urgite with groundmass hornblende, kullaite, and syenite-porphyry. The resembles metasomatized granite-gneiss inclusions in the melanocratic dikes. C. F. D.

GI (Theodor). *Zur Petrographie des östlichen Aarmassivs (Bifertengletscher, Limmernboden, Vättis) und des Kristallins von Tamins.* Schweiz. Min. Petr. Mitt., 1941, vol. 21, pp. 1–120, 2 pls., 20 text-figs.

etailed petrographical descriptions with several chemical analyses of igneous metamorphic rocks. L. J. S.

LKER (F.) & POLDERVAART (A.). *The petrology of the dolerite sill of Downes Mountain, Calvinia.* Trans. Geol. Soc. South Africa, 1941, vol. 43 (for 1940), pp. 159–174, 1 pl., 2 text-figs.

—— *The Hangnest dolerite sill, S.A.* Geol. Mag. Hertford, 1941, vol. 78, pp. 429–450, 1 pl., 2 text-figs.

hese two sills of Karroo dolerite, respectively 200 and 500 feet thick, are ine-free rocks with interstitial micropegmatite. Three pyroxenes are present: y pigeonite with $2V < 30°$, positive; bronzite; and hypersthene-augite with 30–50°, positive, this sometimes margined by late pigeonite. Early eonite and bronzite are antipathetic, the former occurring in the higher, the er in the lower parts of the sills. Much of the hypersthene shows an

intergrowth phenomenon attributed to unmixing of hypersthene-augite. Th is no gravitational differentiation. Rheomorphic veins derived from mobili shales are injected into the dolerite, and xenoliths of siltstone or sandst country-rock are metasomatized to granophyre. C. F. D

Armstrong (J. E.). *The ultrabasic rocks of the Fort Fraser map-area (west ha northern British Columbia.* Trans. Roy. Soc. Canada, 1940, vol. 34, sect. pp. 21–32, 1 fig. (map).

Two large stocks of ultrabasic rock, respectively 65 and 80 square miles area, are formed predominantly of peridotite, with pyroxenite, sometimes rimm by gabbro, towards the margins. Dunite forms irregular bodies within the pe dotite. The complex, which is of Jurassic age, is in parts extensively serpentiniz and steatitized. C. F. D

Grout (Frank F.) & Schwartz (George M.). *The geology of the anorthosites the Minnesota coast of Lake Superior.* Bull. Minnesota Geol. Surv., 19 no. 28, 119 pp., 6 pls., 49 text-figs.

Anorthosite occurs over a wide area as abundant angular to rounded inclusio in Keweenawan diabase, these xenoliths ranging from small size up to nea half a mile in length. The anorthosite masses are believed to have been broug up from depth by the diabase magma. New chemical analyses and petr graphical descriptions are given. C. F. D.

Larsen (E. S.), Hurlbut (C. S., *Jr.*), Griggs (David), Buie (B. F.), & Burge (C. H.). *Igneous rocks of the Highwood Mountains, Montana.* Bull. Ge Soc. Amer., 1939, vol. 50, pp. 1043–1112, 13 pls., 15 text-figs.; ibid., 194 vol. 52, pp. 1733–1868, 16 pls., 18 text-figs.

The classical igneous province of the Highwood Mountains has been reinves gated by a group of Harvard geologists under the supervision of Larsen. T present report contains much petrographical and structural detail in a collecti of seven papers on the laccoliths, the extrusive rocks, dikes and related roc the stocks, contact metamorphism, mineralogy, and petrology. The differenti tion of Shonkin Sag and eight other laccoliths, formed principally of shonkini and syenite, is attributed to settling of heavy crystals accompanied by min rising of leucite. The lavas are mafic phonolites, with leucite, pseudoleucite analcime, and quartz-latites. Closely related rock-types are found in the dik along with which is also described an irregular intrusive body of nephelin alnöite or turjaite with monticellite-peridotite. A new term, headed dike, introduced for an intrusion linear in plan and bulbous in cross-section, narrowi downwards to a feeder dike; the example described is differentiated into fergusi (mafic pseudoleucite-syenite) and shonkinite by flotation of leucite and sinkin of augite. Most of the stocks are made up of shonkinite and mafic syenite, b small bodies of leucite-rich rocks—missourite and niligongite (leucite-ijolite)- are present in the Shonkin stock. Early magmatic sanidine in the shonkinit and phonolites is rich in barium. Besides the previously published data [M. 7–448], the following chemical analyses of minerals, by F. A. Gonyer, are liste I, monticellite, twinned into trillings on (031), with 2V 82°±3°, negative, fro

icellite-peridotite; II, 'barium sanidine', with 2V 48°, negative, from mafic olite; III, natrolite high in $H_2O$, sp. gr. 2·285, nodules in mafic phonolite.

| | $SiO_2$. | $TiO_2$. | $Al_2O_3$. | $Fe_2O_3$. | FeO. | MnO. | MgO. | CaO. | $Na_2O$. |
|---|---|---|---|---|---|---|---|---|---|
| ... | 36·67 | 0·13 | 0·75 | 0·10 | 7·57 | 0·17 | 21·11 | 32·56 | nil |
| ... | 57·80 | 0·17 | 21·55 | 0·29 | 1·14 | — | 0·72 | 1·35 | 3·71 |
| ... | 44·85 | nil | 27·94 | 0·20 | | nil | nil | 2·00 | 14·47 |

| | $K_2O$. | $H_2O-$. | $H_2O+$. | BaO. | SrO. | Total. | $\alpha$. | $\beta$. | $\gamma$. |
|---|---|---|---|---|---|---|---|---|---|
| ... | 0·25 | — | 0·15 | 0·18 | 0·08 | 99·72 | 1·654 | 1·664 | 1·674 |
| ... | 8·00 | 0·21 | | 5·02 | — | 99·96 | 1·536 | 1·542 | 1·546 |
| ... | nil | 0·51 | 10·17 | nil | nil | 100·14 | 1·489 | 1·491 | 1·501 |

C. F. D.

RA (William T.). *Structure and petrology of the Boxelder laccolith, Bearpaw Mountains, Montana.* Bull. Geol. Soc. Amer., 1941, vol. 52, pp. 817–853, pls., 14 text-figs.

accolith of Shonkin Sag type, 450 feet thick and 2 miles across, consists of me-syenite underlain by an assemblage of shonkinites. Narrow irregular of plagioclase-free aplitic syenite, probably representing residual liquid, these rocks. The complex is believed to have arisen by post-intrusion tational differentiation of a shonkinitic magma, followed by a later intrusion differentiated) shonkinite when the first magma had largely crystallized.

C. F. D.

KER (Frederick). *Differentiation of the Palisade diabase, New Jersey.* Bull. Geol. Soc. Amer., 1940, vol. 51, pp. 1059–1105, 4 pls., 9 text-figs.

w data presented on the Palisade sill include 15 chemical and over 100 metric analyses. The greater part of the intrusion, which is more than feet thick, is micropegmatite-bearing dolerite, but chilled marginal phases olivine (1–3 %) and the classical olivine-diabase layer 30–60 feet above wer contact, averaging 15 feet thick, contains up to 25 % olivine. The xenes present include pigeonite, hypersthene-augite, hypersthene, and a ic intergrowth of ortho- and clinopyroxenes attributed to unmixing. rsthene and pigeonite are incompatible, the former not occurring above eet from the lower contact, and the latter rarely below this level. Apart a possible upward migration of volatiles resulting in hydrothermal altera- the differentiation of the sill can be adequately accounted for by gravita- settling.

C. F. D.

EN (Norman L.). *Progressive metamorphism of siliceous limestone and dolomite.* Journ. Geol. Chicago, 1940, vol. 48, pp. 225–274, 15 figs.

this detailed paper the progressive metamorphism of siliceous dolomitic tones is considered with the aid of a tetrahedron of apices CaO, MgO, $SiO_2$, $O_2$. It is suggested that in a carbonate formation showing in different beds siderable range of proportions of calcite, dolomite, and silica, there are en steps or grades of decreasing carbonation, taking place at successively r temperatures at any given pressure. Ten of these steps are characterized e appearance of a new metamorphic mineral, these minerals being, in order

of production with rising temperature, tremolite, forsterite, diopside, pericl wollastonite, monticellite, åkermanite, spurrite, merwinite, and larnite. T order is approximately the sequence of discovery of these minerals in nat and, presumably, a sequence of increasing rarity, the temperatures necess for formation of the 'higher' minerals not being available in metamor processes except, strongly localized, in small masses of rock. The retrogres metamorphism of siliceous carbonate rocks, and the application of the fa concept to them, are also discussed. Subsequent to Bowen's statement (p. 2 that tricalcium disilicate does not occur in nature, Tilley has described mineral from Scawt Hill under the name rankinite [Min. Mag. **26**, 190].

C. F. I

Scheumann (K. H.). *Das Problem der Cordierit-Gneise im Sächsischen Gran gebirge.* Min. Petr. Mitt. (Tschermak), 1941, vol. 53, pp. 147–154.

The Saxon granulites consist of an upper portion rich in muscovite, whic separated along a thrust-plane from the main block consisting of mica-poor r with garnet, spinel, and kyanite in place of muscovite. In the fractured z are metabasites and metagranites, intimate mixtures of these by a proces 'phyrasis' are called 'phyrdemites' [*φύρω*, to mix up]. Later intrusions of gra along the thrust-plane gave rise to other rocks, including the cordierite-gn of Waldheim, which is only slightly deformed without mylonitization, bu part altered to garnet-sillimanite-rocks. L. J. S

Keiller (Alexander), Piggott (Stuart), & Wallis (F. S.). *First report of sub-committee of the south-western group of museums and art galleries on petrological identification of stone axes.* Proc. Prehist. Soc., 1941, new s vol. 7, pp. 50–72, 1 pl., 6 text-figs.

A small wedge- or slab-shaped piece, suitable for preparation of a thin sect was cut from each of two hundred prehistoric implements found in SW. Engla the void in the specimen being later infilled with plaster and coloured. Pe graphical examination of the implements resolves them into nine distinct grou including principally epidiorite, greenstone, and sheared tremolite-rock f Devon or Cornwall, calc-silicate killas from (?) near St. Ives, fine-grained b tuff from the Borrowdale volcanic series, augite-granophyre from Penmaenma and porcellanitized bauxitic clay (contact altered) from Tievebulliagh Hill, Antrim. Detailed reference is made to earlier petrographic work on impleme from SW. England. C. F. D

Ichimura (Takeshi). *Some glauconitic rocks from Taiwan (Formosa).* [M Fac. Sci. Agric. Taihoku Univ., 1940, vol. 22, no. 3 (Geol. no. 16), pp. 25- 4 pls., 7 text-figs.]; abstract in Japanese Journ. Geol. Geogr., 1941, vol. pp. 12–13.

Glauconite rocks are widely distributed in the Tertiary formations of Form and are composed of quartz, plagioclase, calcite, muscovite, &c., with a var of heavy minerals. As seen in thin sections the glauconite of Palaeogene r is light bluish, while that of Neogene rocks is light yellowish-green. $K_2O$ generally less than 3 % even in highly glauconitic rocks, and it does not exc 6 %. L. J. S

## Economic Minerals and Ore-Deposits.

*ineral map of Europe.* Compiled by the Geological Department, The Pure il Co., Chicago, Illinois, 1940, 61 pp., 1 pl. (map). Price $3.50.

tistics are given of the greater sufficiency or deficiency in the production of minerals through acquisition of territory by Germany, U.S.S.R., Hungary, taly, also the production of coal, lignite, iron ore, and petroleum by several pean nations and their possessions. These are followed by tables showing cations of strategic minerals, known or estimated reserves, production in c tons, percentage of world production, consumption, sufficiency or de- y, &c. for all the European nations. There are sections under the following ngs: fuels (coal, lignite and brown coal, crude petroleum, oil shale, natural industrial metals (iron ore, copper, lead, zinc, tin, bauxite); precious metals silver, platinum); ferro alloys (chromium ore, manganese, molybdenum, , tungsten, antimony); others (potash, magnesite, sulphur, pyrite, asbestos, um, mercury, mica, apatite). The lists have been compiled mainly from the n Minerals Quarterly and the Minerals Yearbook (U.S. Bureau of Mines), complete bibliography is given at the end and a useful map (scale, 115 miles nch) shows the percentage of world production by the various countries. purpose of the work is to determine to what extent Europe can be self- ient. J. M. S.

CLIN (Sven). *Geology and ores of the Malånäs district, Västerbotten, Sweden.* Årsbok Sveriges Geol. Undersökning, 1940, vol. 33, no. 4, pp. 1–198 (English), 199–221 (Swedish Summary), 38 pls. including coloured geol. maps, 30 text-figs.

ghly metamorphosed Archaean quartz-porphyry, keratophyre, and 'green- ' lavas and tuffs, overlain by graphite-bearing phyllites and by arkoses, are ded by granitic rocks of two ages, to the later of which are related several nide ore-bodies. The ores comprise principally pyrite and pyrrhotine with or less chalcopyrite, blende, galena, mispickel, and other sulphides. Gud- dite is a common accessory. The differentiation of the ores and the relation mineralization to regional metamorphism are discussed. The wall-rocks are itized and chloritized quartz-porphyry, locally bearing almandine-pyrope, rolite, cordierite, andalusite, chloritoid, and gahnite. The last, analysed by ssarsson, gives $Al_2O_3$ 55·71, $Fe_2O_3$ 7·78, FeO 1·18, CaO 0·00, MgO 0·98, 0·05, ZnO 33·95, $SiO_2$ 0·26, insol. in $K_2S_2O_7$ 0·32 = 100·23. C. F. D.

ANINA (Jos.). *Étude métallographique des minerais de Příbram (Tchéco-slovaquie).* Bull. Soc. Franç. Min., 1937, vol. 60, pp. 152–223, 4 pls., 3 text-figs.

general account of the geology and history of the Příbram mines is followed description of the 43 mineral species observed, including chemical reactions olished sections and optical data. A table of measured reflectivities for the ue minerals from this locality is given, also data for decreased reflectivity photochemical attack of argentite, polybasite, and stephanite. The para- sis of the deposits is discussed and a full bibliography appended.

F. A. B.

Koch (Werner). *Zur Petrographie der Lagerstätte St. Christoph bei Breitenbru* (*Erzgebirge*). Min. Petr. Mitt. (Tschermak), 1941, vol. 53, pp. 118–146, 11 fi

The ore, consisting of magnetite, pyrrhotine, mispickel, ferriferous bler ('christophite'), cassiterite, &c., occurs in irregular pockets in skarns int bedded with quartz-phyllite-hornfels near the contact of the Eibenstock gran in Saxony. Petrographical descriptions are given of micro-sections of bore-co down to the granite. The skarns consist of pyroxene, hornblende, plagiocla garnet, and idocrase in varying amounts, and they no doubt represent calcare bands in the metamorphosed phyllites. L. J. S

Coulson (A. L.). *Chromite.* Bulletins of Economic Minerals, no. 2, Rec. Ge Surv. India, 1941, vol. 76, 30 pp. Price *As.* 10 = 1*s.*

Krishnan (M. S.). *Strontium minerals.* Ibid., no. 3, 1941, 16 pp., 1 pl. Pr *As.* 6 = 7*d.*

—— *Phosphates.* Ibid., no. 4, 1941, 38 pp., 1 pl. Price *As.* 12 = 1*s.*

In this new series the uses, grading, and marketing, and world occurrences these economic minerals are mentioned briefly, and an account is given of th distribution in India. C. F. D.

Dunn (J. A.). *The mineral deposits of eastern Singhbhum and surrounding are* Mem. Geol. Surv. India, 1937, vol. 69, pt. 1, vii+279+xxiii pp., 23 p 15 text-figs.

The memoir is divided into three sections dealing with copper ores, iron or and other deposits. Much detailed information is given on mining; and in t section on mineralogy an account of violarite from Singhbhum copper ores as w as an unknown grey to violet-blue flaky mineral from the Rakha mines a Mushabani is given. Magnetite ore from Dhalbhum carries from 0·59 to 4·48 $V_2O_3$ [M.A. **6**–489]. Reproductions of photographs of polished ore-sections w illustrate the paragenesis of the copper, nickel, and iron minerals. F. A. B.

*The mineral resources of the Union of South Africa.* Compiled in the office of t Geological Survey (Dept. of Mines), Pretoria. 3rd edition, 1940, 544 p 6 maps, 68 text-figs. Price 5*s.*

The latest edition of this comprehensive publication [M.A. **6**–508] consists 40 pages on the topography and geology of South Africa, with coloured ma some 430 pages on the mineral resources of the Union, and miscellaneous inform tion on mining legislation, &c. The work, which is published at a low price, essentially a readable digest, brought up-to-date, of the economic informati included in the memoirs of the South African geological survey, and it shou hence prove especially useful to libraries or university departments which do n possess these memoirs. C. F. D.

Lord (C. S.). *Mineral industry of the Northwest Territories.* Mem. Geol. Sur Canada, 1941, no. 230, vi+136 pp., 9 figs. Price 50 cents.

This memoir describes one of Canada's youngest mineral-producing distric which in 1939 yielded gold, silver, copper, petroleum, and radium-uranium co

ates to the value of $4\frac{1}{2}$ million dollars, more than half of this sum being nted for by the output of radium-uranium ores from Great Bear Lake. uction of minerals prior to 1932 was negligible. A brief account is given of eology, mineralization, and development of the mining properties in the nce, and an extensive bibliography of recent publications is included.

C. F. D.

(Horatio C.). *Gold deposits of Porto Rico.* Rocks and Minerals, Peekskill, N.Y., 1941, vol. 16, pp. 404–405.

survey of the gold deposits of Porto Rico is being carried out. In the early of the Spanish régime a considerable amount of gold was produced, but gh the ores are of a fair concentration the difficulty of transport makes uction costly. The main localities are Barranquitas on the Rio Plata, al, Guayama, and San German. [M.A. **8**–233.] J. M. S.

EL (V. K.)] Земель (В. К.). Распространение редких элементов в рудах некоторых золотых месторождений.—Semel (V. K.). *Distribution des éléments rares dans les minerais de quelques gisements d'or.* Журнал Прикладной Химии (Journ. Appl. Chem.), Leningrad & Moscow, 1936, vol. 9, pp. 1972–1984, 1 fig. (Russian with French résumé.)

pectroscopic analysis of gold ores shows an enrichment in Bi, Te, Co, Mo, Sn. Tl, Ga, Ge, and In are present, but are not concentrated in the gold minerals.

M. H. H.

LAGHER (David). *A preliminary account of the geology of a portion of the Lupa goldfield.* Econ. Geol., 1939, vol. 34, pp. 243–267.

– *A microscopic study of some ores of the Lupa goldfield, Tanganyika Territory, East Africa.* Ibid., 1941, vol. 36, pp. 306–323, 1 fig.

his region is a complex of pre-Cambrian igneous rocks with numerous gold-ring quartz veins which are genetically related to a widespread invasion of kite (analysis by F. Oates): $SiO_2$ 76·64, $TiO_2$ 0·02, $Al_2O_3$ 13·55, $Fe_2O_3$ 0·27, 0·18, MnO 0·00 (?), MgO 0·08, CaO 0·68, $Na_2O$ 3·80, $K_2O$ 5·27, $H_2O+$ 0·12, $-0·02$, $P_2O_5$ 0·03, Cl 0·04, S none, $Cr_2O_3$ none, BaO trace, SrO none, less O for ·02 = 100·68. The ore of Saza mine consists of quartz, carbonate in fractures, 1 % of metallic minerals: pyrite, chalcopyrite, galena, blende, altaite (?), l. At Danny Maher's mine pyrite and intergrowths of chalcopyrite and cuban-precede magnetite, contrary to Schwartz and Ronbeck [M.A. **8**–174], but dy's sequence [M.A. **8**–36] finds support. M. A. P.

LAND (G. Carman). *Mineralogy of the Negus and Con mines, Yellowknife, Northwest Territories, Canada.* Econ. Geol., 1941, vol. 36, pp. 45–70, 16 figs.

t these recently opened mines on the north shore of Great Slave Lake visible l occurs in mineralized quartz-carbonate veins following shear zones 1–18 feet e in a strongly faulted series of pre-Cambrian andesitic flows and dikes. rty-three sparse and fine-grained metallic minerals, including gudmundite, identified with more or less certainty in polished sections. M. A. P.

Newcomb (R. C.). *Gray quartz breccia ore body of the Highland mine, Bu Montana.* Econ. Geol. 1941, vol. 36, pp. 185–198, 9 figs.

This auriferous (0·6 oz./ton) quartz ore-body is a sponge-breccia replac Cambrian dolomite. The removal of sulphides, mainly pyrite, by solution v followed by prodigious slumping, weak cementation with silica, and furth leaching. M. A. P.

Galbraith (F. W.). *Ore minerals of the La Plata mountains, Colorado, compa with other telluride districts.* Econ. Geol., 1941, vol. 36, pp. 324–334, 8 fig

In the La Plata district the quartz gangue, often with roscoelite, contains co mon sulphides followed by hessite, coloradoite, krennerite, calaverite, sylvanite, a petzite, with gold commonly in veinlets penetrating tetrahedrite, coloradoi and hessite, in order of preference. At Cripple Creek, Colorado, hessite, calaveri and an undetermined gold-silver telluride were also formed after the sulphid At Kirkland Lake and Porcupine, Ontario, the sulphides are followed by altai coloradoite, calaverite, krennerite, and gold. Native tellurium was found polished sections from Cripple Creek and Ontario. M. A. P.

Auger (P. E.). *Zoning and district variations of the minor elements in pyrite Canadian gold deposits.* Econ. Geol., 1941, vol. 36, pp. 401–423, 5 figs.

The relative amounts of 25 minor elements, mostly metals, determined spectr graphically in 124 samples of selected pyrite crystals from numerous mines, sh regional consistency and some connexion with the type of deposit or the temper ture of formation. Gold does not enter the crystal-structure and its distributi is erratic. Several hundred samples of sulphides from known depths in the H linger, Noranda, and Siscoe mines show systematic variation of the minor elemen with depth. M. A. P.

Mertie (J. B., *Jr.*). *Platinum deposits of the Goodnews Bay district, Alask* Bull. U.S. Geol. Surv., 1939, no. 910–B, pp. 115–145, 1 pl., 3 text-fig Price 15*c*.

Placer deposits of the platinum metals, discovered in 1926 and now yieldir about 20,000 oz. per annum, are in a valley draining mountains of peridotit dunite, and perknite. The platinum is associated with chromite and is believe to be derived from dunite. Many chemical analyses are given. C. F. D.

Bastin (Edson S.). *Paragenetic relations in the silver ores of Zacatecas, Mexic* Econ. Geol., 1941, vol. 36, pp. 371–400, 9 figs.

In this famous district whose output from 1548 to 1888 is valued at 87 million pesos, the prevailing order of deposition of the hypogene minerals, shown by 23 paragenetic diagrams, was: pyrite, blende, quartz; nearly simu taneous tetrahedrite, galena, chalcopyrite, argentite; sulphantimonides of silve calcite. Silver and some argentite are supergene. M. A. P.

Willard (Max. E.). *Mineralization at the Polaris mine, Idaho.* Econ. Geol 1941, vol. 36, pp. 539–550, 7 figs.

In this important silver mine 5 miles NW. of Wallace, Coeur d'Alene distric the general order of deposition of the metallic minerals was: pyrite, gersdorffit

to the 'Silver Belt'), mispickel, tetrahedrite (freibergite with 5·4 % Ag), nonite, chalcopyrite, galena, boulangerite. M. A. P.

(Clyde P.). *The quicksilver deposits of the Terlingua region, Texas.* Econ. Geol., 1941, vol. 36, pp. 115–142, 5 figs.

e output from this district in Brewster county, in the Big Bend of the Rio de, was 150,000 to 200,000 flasks from 1899 to 1938, most of which came from Chisos mine. Cinnabar and calcite impregnated with asphalt occur at small hs in lodes near the base of the Lower Cretaceous Del Rio clay, associated faults in the Upper Cretaceous Boquillas flags, and in a fractured wedge-ed mass (sphenolith) of intrusive quartz-trachyte. The ore was presumably ed by alkali sulphide solutions and precipitated by mingling with ground-r at low temperature and pressure, but the genetic significance of the nen is not understood. [M.A. 8–42, 177.] M. A. P.

FELD (Friedrich). *The Bolivian tin belt.* Econ. Geol., 1936, vol. 31, pp. 48–72, 3 figs.

(Federico). *Zoning in the Bolivian tin belt.* Ibid., 1941, vol. 36, pp. 569–588, 5 figs.

onal distribution of minerals is well shown in most of the tungsten and many he tin deposits, which are clearly associated with granitic intrusions. The mony deposits show no connexion with intrusive rocks and little zoning. e of the tin and silver deposits are associated with dacite and rhyolite, but ng is not well displayed. [M.A. 5–166.] M. A. P.

TE (Charles Henry). *A theory for the concentration and distribution of copper in the earth's crust.* Econ. Geol., 1941, vol. 36, pp. 1–18.

review of published reports on 81 mines and districts producing most of the ld's copper shows that chalcopyrite—bornite, chalcosine, tetrahedrite, enar-, tennantite, cubanite—bournonite, luzonite, covelline, in order of decreasing uency, replace fractured and sheared rocks of all kinds usually after the in-ion of basic magmas. This accords with the theory that copper sulphides mulated below the basic magma zone, by the action of gravity, and the nation of compounds in the order of their heats of formation during the ing of a fluid earth. M. A. P.

HN (Truman H.). *Pipe deposits of the Copper Creek area, Arizona.* Econ. Geol., 1941, vol. 36, pp. 512–538, 9 figs.

n this area in the Galiuro Mts., 60 miles NE. of Tucson, the most important ducer is the Childs-Aldwinkle breccia pipe in which pyrite, chalcopyrite, nite, chalcopyrite, chalcosine, enargite, tennantite, blende, galena, and molyb-ite (the most valuable ore), were deposited in that order under mesothermal ditions. Typical minerals found near the surface are ferromolybdite, malachite, ssylite, cuprite, covelline, chalcosine. M. A. P.

DERSON (Alfred L.). *A copper deposit of the Ducktown type, near the Coeur d'Alene district, Idaho.* Econ. Geol., 1941, vol. 36, pp. 641–657, 6 figs.

The Mizpah copper deposit, 40 miles SW. of the Coeur d'Alene district, is a

hypothermal replacement, rather than a pyrometasomatic deposit, in Belti quartzite. The formation of silicates and ferriferous dolomite was followed by t deposition of pyrrhotine, mispickel, and chalcopyrite intergrown with cuba ite. Secondary minerals within 25 feet of the surface include marcasite, chalc sine, fibrous malachite, chessylite, cuprite, and limonite. M. A. P.

Dunn (J. A.). *The origin of iron ores in Singhbhum, India.* Econ. Geol., 19 vol. 30, pp. 643–654.

—— *Origin of the banded hematite ores in India.* Ibid., 1941, vol. 36, pp. 355–3 2 figs.

The iron ores of Singhbhum and the Feudatory States of Orissa are genera associated with an Archaean banded haematite quartzite similar to the itabir of Brazil, the taconite and jaspilite of Lake Superior, and the 'calico rock' South Africa. The Indian rocks are believed to have been mainly fine-bedd ferruginous tuffs that were oxidized, silicified by cool solutions, and repeated enriched by ferruginous solutions to give iron ores. M. A. P.

Woolnough (W. G.). *Origin of banded iron deposits—a suggestion.* Econ. Geo 1941, vol. 36, pp. 465–489.

The banded iron ore deposits of the older pre-Cambrian throughout the wo represent epicontinental sediments formed as chemical precipitates from cc solutions in closed basins on a peneplaned land surface. M. A. P.

Frasché (Dean F.). *Origin of the Surigao iron ores.* Econ. Geol., 1941, vol. 3 pp. 280–305, 17 figs.

The deposit is a mantle 0–100 feet thick (average 21 feet) of limonite with so haematite, magnetite, and bauxite, overlying serpentine and covering abo 58 sq. miles in the NE. of the Province of Surigao, Mindanao, Philippine Islan The red to yellow ore grades into the underlying serpentine and, like the Cub laterites, is clearly the result of alteration of the serpentine in place. Thr analyses of serpentine rock are given and 58 commercial analyses representi the composition of the ore at one-foot intervals from the surface to the serpentin The average Fe-content of 2000 samples of the ore, from analyses by H. C. Wi is 47·77 %. M. A. P.

Woodland (Austin William). *The petrography and petrology of the manganese o of the Rhiw district* (*Carnarvonshire*). Proc. Geol. Assoc. London, 193 vol. 50, pp. 205–222, 2 pls., 1 text-fig.

The manganese ore is intercalated among Upper Arenig sandstones and shal which are much sheared. It consists of red, purple, and green-black, compac fine-grained rocks which represent a volcanic tuff altered by hydrothermal actio with the development of chlorite, epidote, sericite, rhodochrosite, &c. Some a pisolitic with nodules of psilomelane, and in the green-black rock collophani ($n$ 1·62, isotropic) is present. Analyses of the least-altered keratophyre tu ($SiO_2$ 57·63, MnO 2·62, &c.), the red ore-rock ($SiO_2$ 24·51, MnO 32·19, $Fe_2O$ 12·15 %, &c.), and the green-black rock ($SiO_2$ 20·26, MnO 12·71, FeO 16·1 $P_2O_5$ 5·12 %, &c.) illustrate the gradual replacement of albite by Mn, Fe, and C [M.A. 7–437.] L. J. S.

ENSON (John S.). *Tungsten deposits of British Columbia.* Bull. British Columbia Dept. Mines, 1941, no. 10, vii+103 pp., 2 maps, 5 pls., 5 text-figs.

tails are given of 8 major occurrences and 26 minor occurrences (locations ed on map), but the total annual output is less than 100 tons. Hints are for further prospecting. The usual tungsten mineral is scheelite, occurring artz veins with metallic sulphides (including stannite) and gold and silver. 'oyster-white' fluorescence in ultra-violet light has been used for detecting lite on rock faces and in milling processes. The plates show specimens photo- ned in fluorescent light. Notes are added on the occurrence in other countries, &c. A detailed bibliography is given under various subject headings.

L. J. S.

ERING (T. S.). *The origin of the tungsten ores of Boulder County, Colorado.* Econ. Geol., 1941, vol. 36, pp. 229–279, 17 figs.

e ore (1·5–20 % $WO_3$) consists of granular ferberite (also as fine crystals) and tz with a large variety of accessory minerals including occasional gold ides and gold, in shallow veins in an area of pre-Cambrian quartz-monzonite quartz-biotite-schist which were intruded by early Tertiary monzonitic and c bodies. A detailed study of the wall-rock alteration suggests that the miner- tion was due to acid solutions originating in the Tertiary eruptives, followed eutral to alkaline solutions. [M.A. **8**–36.]

M. A. P.

D (Frédéric von der). *Le gisement de molybdénite d'Azegour et la région des Guedmioua (Atlas de Marrakech, Maroc).* Genève (Georg et Cie.), 1941, 88 pp., 11 pls., 16 text-figs. (Thèse, Univ. Genève, 1941.)

detailed account is given of the geology, petrography, and mining at gour [M.A. **5**–169, 420]. The production in 1938 was 206 tons of concentrate $S_2$ 75·8 %). Molybdenite occurs in bands of garnet-rock with diopside, rase, and chlorite in crystalline limestones near a granite contact. This mode ccurrence differs from those of the usual type in granite, pegmatite, quartz s, and mineral veins. Duparcite [M.A. **5**–292] from this deposit is a variety of rase, and genevite [M.A. **3**–368], also from Morocco, is identical with this.

L. J. S.

KE (H. C.) & CLARK (T. H.). *Thetford, Disraeli, and eastern half of Warwick map-areas.* Mem. Geol. Surv. Canada, 1937, no. 211, vi+160 pp., 5 maps, 1 pl., 26 text-figs. Price 50*c*.

his memoir gives the general and economic geology of the area and includes a iled account of the asbestos and chromite occurrences. Fourteen chemical lyses by R. J. C. Fabry are listed which include not only chrysotile fibre but serpentinized walls of veins and altered serpentine close to acid dikes. A most resting résumé of theories of formation of the chrysotile veins is followed by author's theory which assumes that faulting of the margin of the peridotite ies permitted the percolation of a dilute aqueous solution of a kind that was to give up water freely and take considerable amounts of silica readily into tion, and the injection of acid dikes in sufficient numbers to raise the tem- ature of the serpentine to a point where it would react readily with the solu- s.

F. A. B.

Spence (Hugh S.). *Talc, steatite and soapstone; pyrophyllite.* Canada, Bure of Mines, Report no. 803, 1940, vii+146 pp., 8 pls., 4 text-figs. Price 50c

A report on Canadian talc and soapstone occurrences, with data on wo production, methods of mining and milling, utilization, and markets, and wit section on industrial pyrophyllite. C. F. D.

Bemmelen (R. W. van). *Origin and mining of bauxite in Netherlands-Ind* Econ. Geol., 1941, vol. 36, pp. 630–640, 3 figs.

The aluminium industry of Japan depends largely on bauxite (alumin laterite, $Al_2O_3$ 53, $SiO_2$ 2·5, $Fe_2O_3$ 13·5, $TiO_2$ 1·2 %) produced since 1935 mai on Bintan island near Singapore. The deposits have an average thickness of feet and they were formed by alteration of the underlying hornfels. [M.A. **8**–17 M. A. P.

Cameron (A. E.). *Barytes deposits at Pembroke, Hants County, Nova Sco* Proc. Nova Scotian Inst. Sci., 1941, vol. 20 (for 1940–41), pp. 57–63.

A large body (estimated at over a million tons) of high-grade pale red bar occurs in a synclinal fold in Palaeozoic sediments. It appears to be due to placement of iron-rich calcareous beds. L. J. S.

Chowdhury (Ramani Ranjan). *Handbook of mica.* London (W. Thacker & C 1939, xvi+344 pp., 25 figs. Price 22*s.* 6*d.*

This work deals more particularly with the Indian mica trade, but also inclu chapters on the occurrence, mining, and technology of commercial mica throu out the world. [M.A. **8**–44.] C. F. D.

[Selyakov (S. N.)] Селяков (С. Н.). Нитратно-хлоридные солончаки и м торождения селитры средней Азии.—Seliakov (S.). *Nitrate-chlor solonchaks and the saltpeter deposits of middle Asia.* Труды Почвенно Института имени В. В. Докучаева, Акад. Наук СССР (Trans. Dokuchai Soil Inst., Acad. Sci. U.S.S.R.), 1941, vol. 22, no. 2, 84 pp., 9 fi (English summary pp. 82–84.)

Nitrates, formed by the nitrification of organic matter in rocks and soils (n necessarily in the neighbourhood of human habitations) and from the atmosphe are transported in solution and accumulate in 'solonchaks' (salt-pans) amongst t foot-hills of the mountains in a semi-arid region. At Bak-Budi in the dry delta the Kashka-Daria, Bokhara, the deposit is estimated at 600,000 tons.

L. J. S.

Kerr (Paul F.). *A pinitized tuff of ceramic importance.* Journ. Amer. Cera Soc., 1940, vol. 23, pp. 65–71, 4 figs.

Page (G. A.), Raine (F. F.), & Sullivan (V. R.). *Development and prelimin studies of pinite: a rock composed of hydrous aluminium silicates.* Ibi 1940, vol. 23, pp. 71–77, 13 figs.

The term pinite is used as a rock name for an acid igneous rock hydrotherma altered to a pyrophyllite-sericite aggregate. Deposits near Rochester, Neva are worked for the ceramic industry. C. F. D.